2020 Fall Math 229 Final - Due 12.18 Friday

REVIEW SHEET VERSION

1. Fill in the blanks in the MATLAB screenshot.

```
>> linspace( 9 , 16 , 6 )

ans =

9.0000 10.4000 11.8000 13.2000 14.6000 16.0000
```

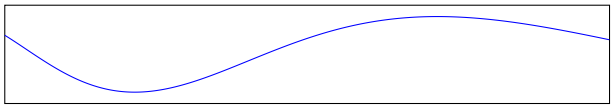
2. Fill in the blanks in the MATLAB screenshot.

```
>> 9 : 1.4 : 16

ans =

9.0000 10.4000 11.8000 13.2000 14.6000 16.0000
```

3. Fill in the blanks in the MATLAB screenshot, where we plot over the interval [9,16]

$$y = \sin^2 \frac{66}{x}$$

```
>> x = linspace( 9 , 16 ,1000);
>> y = sin(66./x).^2 ;
>> plot(x,y)
```



4. Find the real solution to $4x^5 - x^4 + 66 = 0$.

```
>> format short
>> roots( [4, -1, 0, 0, 0, 66] )

ans =

1.4696 + 1.0279i
1.4696 - 1.0279i
-0.4924 + 1.6635i
-0.4924 - 1.6635i
-1.7045 + 0.0000i
```

5. Make a limit table with 5 rows to estimate

$$\lim_{x \to 1^-} \frac{66 \arccos x}{100\sqrt{1-x}}$$

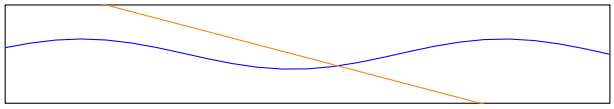
```
>> format long
>> x = 1 - 0.1.^[1:5] ;
>> y = 66*acos(x)./100./sqrt(1-x);
>> [x;y]'

ans =

0.900000000000000 0.941339527312991
0.990000000000000 0.934160523941220
0.999000000000000 0.933458750418276
0.999900000000000 0.933388729515850
0.999990000000000 0.933381728985452
```

6. Fill in the blanks in the MATLAB screenshot, where we plot the left and right sides of the equation

$$2\cos(3x) = -7x + 66$$

over the interval [8,11] on the same graph.

```
>> x = linspace( 8,11 );
>> f = 2*cos(3*x) ;
>> g = -7*x + 66 ;
>> plot(x,f,x,g)
```



7. Using the graph you produce in Question 6, estimate the solution to $2\cos(3x) = -7x + 66$ to 1 decimal place.

$x =$ 9.6

Let $f(x) = \dfrac{66}{x}$ for questions 8, 9, 10

8. Make a function file for $f(x) = \dfrac{66}{x}$.

f.m

```
function y = f(x)
  y = 66./x ;
```

9. Estimate $f'(-5)$ by making a limit table with 5 rows.

```
>> format long
>> clear f
>> x = -5 ;
>> h = 0.1.^[1:5] ;
>> [h; (f(x+h)-f(x))./h]'

ans =

0.100000000000000 -2.693877551020414
0.010000000000000 -2.645290581162385
0.001000000000000 -2.640528105622763
0.000100000000000 -2.640052801048398
0.000010000000000 -2.640005279985757
```

10. Find R_5, the Regular Right Sum with 5 rectangles, in order to approximate

$$\int_9^{16} f(x)\,dx$$

```
>> format short
>> clear f
>> a = 9 ;
>> b = 16 ;
>> n = 5 ;
>> w = (b-a)/n;
>> w * sum(f(a+[1:n]*w))

ans =

   35.8189
```